

STUDYING EATING HABITS IN THE VICINITY OF FRENCH NUCLEAR PLANTS AND DOSIMETRIC SENSITIVITY DUE TO INGESTION AFTER AN ACCIDENT

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Ingestion of potentially contaminated foods is the principal threat to consider in protecting the public living in the vicinity of a nuclear plant, whether in times of normal operation or in the event of an accident.

In post-accident situations, the dietary parameters to be most carefully determined are consumption of foods that are most vulnerable to radioactive contamination, particularly the different types of vegetables and dairy products, the proportion of foods produced locally (near the accident site), and the delay between their production and consumption, so as to account for the radioactive decay curve.

National surveys have identified the major characteristics of French eating habits (INSEE 1991, INCA 1998 and INCA 2009). Above and beyond the fact that these surveys do not consider local specificities, the use of their results for dosimetric assessments has certain drawbacks: the categories of foodstuffs most vulnerable to contamination in post-accident situations (fresh fruit and vegetables, fresh milk and cheeses) are very rarely described in detail; the definitions retained for the units of consumption used to calculate individual food intake or home consumption can vary; and finally, representation of the eating habits of an “average” population does not instruct us as to the behaviors of the most sensitive groups.

To counter these limitations, a survey protocol on a local scale has been developed and tested in three recent studies conducted by IRSN around nuclear sites: Marcoule (Rhône Valley, 2010), Chinon-Avoine (Loire Valley, 2008) and Pierrelatte-Tricastin (Rhône Valley, 2004-2005). The prime objective was to describe eating habits that could raise risks of exposure for the population, particularly consumption of foods produced near an industrial site and likely to be contaminated either by authorized releases or after an accidental release. The summarized results of these three studies have enabled validation of a robust, reproducible protocol and confirmed the pertinence of the local scale by highlighting eating habits that can raise risks of exposure for certain population groups. In particular, rates of home consumption vary from one food category to another and are sometimes high: over 90% for the most vulnerable products.

Conducting a survey around each of the sites would therefore significantly improve both the quality of dosimetric assessments and their credibility in the eyes of the public. As a first step, the proposal is to carry out a series of dietary surveys throughout France around sites with different geographical characteristics, most especially in agro-climatic terms, and representative of potentially different eating habits.

